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Preparatory Committee for the Third United Nations Conference to Review Progress Made in the Implementation of the Programme of Action to Prevent, Combat and Eradicate the Illicit Trade in Small Arms and Light Weapons in All Its Aspects
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Working paper submitted by Belgium

Towards an effective marking, record-keeping and tracing of modular and polymer firearms

I. Introduction

1. As early as 2011, during the first Open-ended Meeting of Governmental Experts on the Implementation of the Programme of Action to Prevent, Combat and Eradicate the Illicit Trade in Small Arms and Light Weapons in All Its Aspects, held in New York from 9 to 13 May 2011,[1] some participants identified modular design and the increasing use of polymers in weapon frames as potential challenges for implementing the International Instrument to Enable States to Identify and Trace, in a Timely and Reliable Manner, Illicit Small Arms and Light Weapons (International Tracing Instrument).[2] In particular, some participants stated that the absence of an international standard for the marking of modular weapons may create a situation where the tracing of those weapons may be increasingly hampered or may even become impossible. At the Fifth Biennial Meeting of States to Consider the Implementation of the Programme of Action to Prevent, Combat and Eradicate the Illicit Trade in Small Arms and Light Weapons in All Its Aspects, held in New York from 16 to 20 June 2014,[3] participants noted once again that developments in small arms and light weapons manufacturing, technology and design had implications for the effectiveness of marking, record-keeping and tracing systems. They also acknowledged the challenges as well as the opportunities presented by those developments. With a view to ensuring the continued effectiveness of the International Tracing Instrument and identifying the potential for enhanced marking,

[1] See A/66/157, annex.
[2] See A/60/88, annex.
[3] See A/CONF.192/BMS/2014/2.

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record-keeping and tracing practices, States decided to examine the subject more closely at the Second Meeting of Governmental Experts in 2015.

2. In 2015, Austria, Belgium and Germany contributed to the discussion of these topics on the basis of a joint working paper.[4] After defining some relevant concepts, the paper examined developments in small arms and light weapons design that had not fully been taken into account when the International Tracing Instrument was drafted. The paper contained suggestions aimed at preserving and potentially enhancing the functionality of the Instrument as the international standard for marking, record-keeping and tracing of weapons.

3. Subsequently, in the outcome document of the Sixth Biennial Meeting of States,[5] held in New York in 2016, the need to tackle the issues posed by the marking of polymer and modular weapons was clearly acknowledged. In paragraph 69 of the document, the absolute need to implement the commitments relating to marking under the International Tracing Instrument regardless of the material or methods used in the manufacture of small arms and light weapons was underlined. Paragraph 70 highlighted the need to identify, in national laws and regulations, the essential or structural component for the purpose of the unique marking of modular weapons in line with paragraph 10 of the Instrument. Furthermore, the outcome document also recognized the need to collaborate with the industry on issues related to the marking of small arms and light weapons.

4. On the occasion of the Third United Nations Conference to Review Progress Made in the Implementation of the Programme of Action to Prevent, Combat and Eradicate the Illicit Trade in Small Arms and Light Weapons in All Its Aspects (Third Review Conference), Belgium would like to restate some key elements to be considered in adapting the International Tracing Instrument to the challenges posed by the growing prevalence of modular and polymer firearms. The main objective of this working paper is to establish the basis for an agreement on the main marking-related issues to be addressed and to clarify the general principles that could be applied in tackling those issues. The present working paper proposes that the Third Review Conference should create a group of governmental experts with a clear mandate to prepare an additional annex to the Instrument on marking, to be adopted, ideally, at the seventh biennial meeting of States in 2020.

5. In addition to specific marking proposals for modular and polymer weapons, it is suggested that the group of governmental experts also consider the proposal for clear and unequivocal identification, by means of a unique additional sign, of the serial number of all small arms and light weapons. This additional proposal is designed to avoid errors in serial number identification, which lead to the multiplication of inaccurate entries in registers and thus to unsuccessful tracing requests.

II. Definitions

6. A number of terms used in the present working paper are defined below:

(a) Receiver/frame: the part of a firearm that houses its operating parts or components, including the bolt, trigger group and magazine port;

[4] Available from reachingcriticalwill.org/images/documents/Disarmament-fora/salw/mge2015/documents/WP-Austria-Belgium-Germany.pdf.

[5] See A/CONF.192/BMS/2016/2.

(b) Barrel: the tube, connected to the receiver of a firearm, through which a controlled deflagration is released in order to propel a projectile out of the end at high velocity;

(c) Parts and components: any elements or replacement elements specifically designed for a firearm and essential to its operation, including barrels, receivers/frames, slides, cylinders, bolts or breech blocks;

(d) Accessory: an item that physically attaches to the firearm and increases its effectiveness or usefulness but is generally not essential for the basic intended use of the firearm.[6] One example would be "any device designed or adapted in order to diminish the sound caused by firing a firearm";[7]

(e) Modular weapon: a weapon with a variable configuration, with parts and components that can be changed by the manufacturer, in an armoury workshop or on the field by a user (with or without specific tools), such as a rifle with different interchangeable barrels of different lengths. When a rifle can change calibre thanks to modularity, it is referred to as the "common receiver approach". When one model is offered in different calibres, it is an example of a "family approach". On the military market, the family approach is often combined with modularity.

III. Developments in small arms and light weapons design that might impact the effectiveness of the International Tracing Instrument: identifying feasible and effective solutions

7. Among the various trends in small arms and light weapons technology and design that might impact the effectiveness of the International Tracing Instrument, it is possible to isolate two main categories:

(a) Architecture: modular design;

(b) Materials: increasing use of polymers.

A. Architecture: modular design

8. The configuration of small military arms in the twentieth century was straightforward: a model had one design and one calibre. Since the early 2000s, new designs have been developed to fulfil new military requirements and increase the effectiveness of weapons by adding adaptability to different operating environments. The development of modular weapons led to the introduction of different calibres for a single model and "convertible" or "reconfigurable" weapons with interchangeable parts and components. The different names for this technology included the modularity approach, the family approach and the common receiver approach (see para. 6 (e) above). The present working paper focuses on weapons with a core component (usually the receiver, or the upper or lower receiver in the case of a split-receiver weapon) around which other major parts or components can later be changed by the manufacturer or user.

[6] Benjamin King and Glenn McDonald, eds., "Behind the Curve: New Technologies, New Control Challenges", Occasional Paper No. 32 (Geneva, Small Arms Survey, 2015). Available from www.smallarmssurvey.org/fileadmin/docs/B-Occasional-papers/SAS-OP32-Behind-the-Curve.pdf.

[7] See Protocol against the Illicit Manufacturing of and Trafficking in Firearms, Their Parts and Components and Ammunition, supplementing the United Nations Convention against Transnational Organized Crime, article 3 (General Assembly resolution 55/255, annex).

Impact of modular design on the implementation of the International Tracing Instrument and possible ways of addressing the resulting challenges

9. In paragraph 10 of the International Tracing Instrument,[2] it is stated that "A unique marking should be applied to an essential or structural component of the weapon where the component's destruction would render the weapon permanently inoperable and incapable of reactivation, such as the frame and/or receiver, in compliance with paragraph 7 above. States are encouraged, where appropriate to the type of weapon, also to apply the marking prescribed in subparagraph 8 (a) above or other markings to other parts of the weapon such as the barrel and/or slide or cylinder of the weapon, in order to aid in the accurate identification of these parts or of a given weapon."

10. The requirement under the International Tracing Instrument of marking an "essential or structural component" such as the frame and/or receiver of the weapon requires further elaboration in the case of a modular weapon with a split receiver. In the present paper, it is suggested that the responsibility lies with the original manufacturer, who must specify which part of the split receiver (i.e., the upper or lower part) is the core component of the weapon and should therefore be considered "essential or structural" and marked in line with the Instrument. Any other future manufacturer of the same weapon (for example, under a license agreement) should obviously adhere to the same designation. The information on the essential or structural part should be notified by the original manufacturer to the State where it is established, which will subsequently share the information with the United Nations Office for Disarmament Affairs. In addition to this ad hoc communication, information on the designation of the essential component of a modular weapon could also be submitted to the Office in the biannual reports on the Programme of Action or the Instrument. An ad hoc technical group under the lead of the Office should resolve possible disagreements between manufacturers on the designation of the essential or structural part of similar models of weapons. Ensuring a common approach to the identification of the structural part of similar models is a particularly important issue, given that marking non-essential parts is not a widespread requirement among countries.

11. The content of marks must also account for the modular nature of some weapons. In subparagraph 8 (a) of the International Tracing Instrument, the marking of type, model and calibre is recommended, although the type and calibre can be changed in the case of fully modular weapons. To avoid inconsistencies during a weapon's life cycle, one solution could be to mark only the serial number and model on such weapons. Additional information on all possible configurations could either be added to the marking or made available to States by the manufacturer.

12. For tracing purposes, it could be useful to ensure that marks indicate the modular nature of a weapon. To this end, and by way of illustration, the core component of such a weapon could be additionally marked "(1)", while secondary or non-core components, such as the non-core part of a split receiver and the barrel, could be marked "(2)". "(1)" and "(2)" are simple digits that are easy to record and copy, type or indicate on a form, and they stand for primary/core and secondary/non-core, respectively. The brackets/parentheses would distinguish those markings from others.

13. The encouragement for States, contained in paragraph 10 of the International Tracing Instrument, to mark other parts of a weapon could prove problematic for tracing modular weapons. In particular, the marking of serial numbers without the above-mentioned "(1)" or "(2)" on core or non-core components could create confusion and hamper the tracing process. Therefore, in this paper it is suggested that the visible markings required by the Instrument (serial number and model) be applied either exclusively to the core component — that is, not to the non-core/secondary

components — or in combination with the solution presented above. This does not exclude the marking of barrels with stamps from proof houses, the marking of secondary components with embedded, electronic or micro-markings invisible to the naked eye or clearly distinguishable from the markings required by the Instrument. Any future annex to the Instrument on marking should provide shared guidance on the unique identification and marking of essential or structural parts of modular weapons as well as a mechanism for the exchange of information on the identification of control components.

14. To facilitate international cooperation and to avoid ambiguity in record-keeping for modular weapons, it is suggested that the markings on the core component should be used to create the record associated with the weapon (one core component, one weapon, one record: "1/1/1") and held for tracing purposes. In addition to storing the "1/1/1" record, manufacturers and States would of course be free to keep records on secondary components of modular weapons. In order to keep track of multiple potential configurations, it is recommended that relevant producer information (a list of all configurations) be attached to the register. For marking, record-keeping and tracing in connection with the International Tracing Instrument, however, only the core component should count.

B. Materials: increasing use of polymers

15. Until the early 1980s, steel, wood and Bakelite were the only materials used to design and manufacture firearms. Wood and Bakelite were used for handgrips and butt stocks, while all other firearm parts were made of steel. Plastics were introduced in the late 1970s. Currently, most new military small arms and light weapons include parts made of plastic, aluminium or composite materials. In the past, only handgrips and butt stocks were made of polymer, whereas receivers and entire frames can now also be made of light and highly resistant polymer. Currently, fully polymer firearms are essentially handguns because of the high pressure that the frame of a rifle or machine gun has to withstand and the resulting necessity to make them out of steel, but rapid developments in materials science will make it necessary to tackle the problem of marking polymer weapons for the full range of small arms and light weapons.

Impact on marking

16. Paragraph 7 of the International Tracing Instrument specifies that "all marks required under this instrument are on an exposed surface, conspicuous without technical aids or tools, easily recognizable, readable, durable and, as far as technically possible, recoverable". Under subparagraph 8 (e), States are to undertake to encourage manufacturers to develop measures against the removal or alteration of markings. In paragraph 10, it is specified that: "A unique marking should be applied to an essential or structural component of the weapon where the component's destruction would render the weapon permanently inoperable and incapable of reactivation, such as the frame and/or receiver".

17. Since marks on polymer surfaces are relatively easy to alter or remove in comparison with marks on metal, manufacturers will need to take appropriate measures to ensure that polymer-frame weapons meet the requirements of the International Tracing Instrument. Under the Instrument, States have undertaken to ensure that manufacturers in their respective territories comply with its requirements.

18. Until now, the practice of marking polymer weapons has yielded a limited number of viable technical solutions, including laser engraving, dot-peen/micropercussion marking, the use of windows that make it possible to read

inscriptions on metallic parts situated under a polymer element and the use of metallic inserts in the polymer frame, which is also the recommendation of the international Small Arms Control Standards (ISACS) document on marking.[8]

19. The present paper recommends the adoption of the metal tag approach or, where applicable, the "window to metal frame" approach with regard to the marking requirement contained in paragraph 10 of the International Tracing Instrument. Both approaches are the best suited to guarantee the durability and the recoverability of the marks.

20. The metal tag approach should take into account the need to make it impossible to remove the tag without rendering the weapon permanently unusable.

21. In addition to the inscription of a durable and recoverable serial number and the required inscription under the International Tracing Instrument, weapons with polymer frames pose challenges for import marking by the receiving country, in particular (a) where the import mark should be placed and (b) whether the marking technology available to the receiving country is suitable for that kind of weapon (i.e., whether it will produce a durable mark). Laser engraving machines, coupled with the specific infrastructure and training needed for reliable long-term use, represent a challenge to widespread diffusion, especially in developing countries. Metallic inserts should be of a size allowing for additional markings, including import markings. More broadly speaking, apart from the material of the frame, the marking of imported arms often involves logistical and physical obstacles that can prevent the marking of weapons upon import. Yet, the marking of imported weapons with the year and country of import, as recommended by the Instrument and required by the Firearms Protocol, greatly facilitates the tracing of seized weapons. In particular for the tracing and tracking of weapons in conflict and post-conflict zones, where great numbers of weapons are in circulation and where a different kind of scrutiny is required in comparison to tracing requirements in the context of a criminal investigation, proper import marks accelerate the tracing process significantly. Firearms for governmental use and military small arms are often produced when the order is placed and the end-user is known ("made to order"). This means that for small arms, in the case of international transfers, the required import markings can be put on the weapons by the manufacturer at the time of production. This working method also alleviates the difficulties encountered by receiving countries in putting import markings on polymer frame weapons.

22. In any future annex to the International Tracing Instrument on marking, producers should be encouraged to apply import markings for their clients, especially on polymer weapons, in cases where the end-user is known (weapons made to order). This can be done using techniques that have proven sufficiently durable on polymer, on a metal tag or a window to the metal frame. In cases where the producer disregards the end-user during production or cases where the end-user prefers to apply the import markings, producers should be encouraged to leave enough space on the metal tag or in the window to the metal frame in order to enable the importer to apply the import mark using conventional and accessible techniques. It is acknowledged that there may not be sufficient space to inscribe a succession of multiple import markings, although working with country codes could make it possible to add such identification marks for multiple successive importers. Nevertheless, having an import mark on a firearm will make the original import country more responsible for the proper management of the weapon through its life cycle, thereby reducing possible cases of diversion.

[8] International Small Arms Control Standards (ISACS) 05.30: Marking and record-keeping.

IV. Unequivocal identification of the serial number

23. The quantity of marks on firearms is drastically increasing as a result of the implementation of arms control and arms management policies, which vary from country to country. In parallel, new producers are gaining their share of the market, making the identification of increasingly diverse weapons more complex. Serial numbers, model numbers, logistical numbers and import markings, to name but a few, can confuse insufficiently trained weapons tracing and monitoring personnel and thus complicate the task of registering weapons. Modularity and the possibility of combining a variety of parts and components can reduce or even eliminate coherence between the different marks on a weapon.

24. During the negotiation of a new annex to the International Tracing Instrument on marking, States are therefore invited to reflect on how to devise a straightforward and unequivocal way to identify the serial number of a firearm. This should be done in a coherent way that does not hamper efforts to correctly mark the essential or structural component of modular weapons.

V. Conclusion: proposed adaptation of the International Tracing Instrument to the marking and tracing challenges of polymer and modular weapons

25. Polymer and modular weapons are increasingly present on the market for small arms and light weapons. They provide many advantages for their users, and therefore their number is expected to exhibit strong growth in the near future. Consequently, States have the responsibility and the obligation to adapt existing marking procedures in order to avoid inconsistencies in record-keeping and tracing practices for polymer and modular weapons.

26. The different ways forward presented in the present working paper on the correct identification, marking and recording of essential components of modular weapons, and the durable and recoverable marking of polymer weapons, including the imposition of import markings, were drafted in accordance with the fundamental principle of the International Tracing Instrument, that is, easy access to marking information for tracing purposes. In order to preserve this cornerstone, a unique marking, registration and tracing system for all small arms and light weapons, accessible without high-level technological investment, should be preserved. In order to maintain the Instrument as a coherent tool for all small arms and light weapons, some adaptations are, as discussed herein, necessary nevertheless. Those adaptations should be developed with particular attention to ensuring that they do not complicate or impede non-obligatory practices under the Instrument and the Programme of Action that are already in place in many countries, such as the marking of parts and components.

27. Belgium looks forward, at the Third Review Conference to Review Progress Made in the Implementation of the of the Programme of Action, to the establishment of a group of governmental experts mandated to prepare an additional annex to the International Tracing Instrument on marking, to be adopted, ideally, at the seventh biennial meeting of States in 2020. This endeavour should involve States and, for the sake of wider consultation, representatives of civil society and of the arms-manufacturing industry.